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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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02/24/2005

Hiroya Inaoka

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EXAMINER

TAI, XIUYU

ART UNIT

PAPER NUMBER

4151

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/525,508	<b>Applicant(s)</b> INAOKA, HIROYA	
	<b>Examiner</b> Xiuyu Tai	<b>Art Unit</b> 4151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/24/2005</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "17" and "27" have both been used to designate "heat exchanger". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities: The specification recites "high/low temperature refrigerant" and "high/low pressure refrigerant" as a thermal media. It is not clear if the definition of "high/low temperature refrigerant" is the same as that of "high/low pressure refrigerant". Appropriate clarification is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-, 6, 7, 9-11 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Bass (U.S. 6,272,873) in view of Suzuki (U.S. 4,949,553).

6. Regarding claim 1, Bass discloses a motor vehicle with a self-powered air conditioner system. The system comprises: (1) a cooling device (reference 37 & 17 in Figure 1; claim 1) that cools one of the thermal media (col. 3, line 15; claim 1, a heat sink cooled by a cooling water system), generating a low temperature thermal medium by maintaining the temperature of said one of the thermal media at a predetermined value; and (2) a thermoelectric converter (reference 36 in Figure 1; col. 3, line 14) that generates electricity by utilizing a temperature difference between the low temperature thermal medium (col. 3, line 15; claim 1, a heat sink cooled by cooling water system) and the other one of the thermal media, with said other one of the thermal media (col. 2,

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line 29 –30; claim 1, combustion unit 35 providing heat to a hot surface) being maintained at a temperature higher than the low temperature thermal medium by heat generated during operation of the working device to generate a high temperature thermal medium with said other one of the thermal media (col. 2, line 34 – 38).

7. Bass fails to teach that the cooling device is a heat pump. However, Suzuki discloses an air conditioner for automobiles. The device comprises (1) a heat pump (reference 24 in Figure 1; claim 1) and a cooling water circulating circuit for circulating the engine cooling water (reference 2 in Figure 1; claim 1). Suzuki further teaches that the heat pump is used to regulate engine temperature by circulating an engine cooling water (col. 6, line 12 – 15 & col. 7, line 1 – 6). Therefore, it would be obvious for one having ordinary skill in the art to substitute the cooling device of Bass with the device that uses a heat pump to circulate an engine cooling water as suggested by Suzuki in order to provide better temperature gradient, resulting in higher heat transfer efficiency in Bass' system in the light of the teaching of Suzuki (col. 6, line 64).

8. Regarding claim 6, Bass further teaches that the electricity produced by direct thermal conversion in modules 36 is used to charge truck battery 32 and to provide power to the air conditioning system, reads on "the energy recovery system is for use with an air conditioner and the low temperature thermal medium is used not only for the electricity generation at the thermoelectric converter, but also for assisting air conditioning by the air conditioner" as claimed.

9. Regarding claim 7, Bass' system also comprises switches 15 & 2 (in Figure 1) to regulate the temperature of heat sink (col. 3, line 43 – 45) and air conditioning system

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(col. 3, line 56-62), reads on “further comprising a switching device that switches a course of travel of the low temperature thermal medium, such that the low temperature thermal medium is selectively used for electricity generation at the thermoelectric converter or for assisting the air conditioning by operation of the switching device” as claimed.

10. Regarding claim 9, Bass suggests that electricity produced by direct thermal conversion in modules 36 is used to charge truck battery 32 (col. 3, line 19 – 19), which reads on “the working device is for mounting on a vehicle having a battery, and electricity generated at the thermoelectric converter is used for charging the battery” as claimed.

11. Regarding claim 10, the combustion unit 35 of Bass is the power source of the truck, which reads on “the working device is a power source for the vehicle” as claimed. The hot surface of Bass is provided from the heat generated by the combustion unit 35. However, means to control the temperature of the hot surface can be chosen according to user’s preference.

12. Regarding claim 11, the combustion unit 35 of Bass is a truck’s fuel tank (col. 2, line 62; claim 1) and the air conditioning system is placed in a sleeper cab of the truck (col. 3, line 40), reads on “the working device is for mounting on a vehicle and the air conditioner is mounted on the vehicle” as claimed.

13. Claims 2-5, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bass (U.S. 6,272,873) in view of Suzuki (U.S. 4,949,553) and as evidenced by Critoph et al (U.S. 5,845,507).

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14. Regarding claim 2, a heat pump is known as an adsorption heat pump. This is also supported by the teaching of Critoph. Critoph teaches that the circulating fluid in an adsorptive heat pump is adsorbed and desorbed from an adsorbent (col. 1, line 12–13). Critoph further indicates that ammonia is conventionally used as an adsorbate (i.e. working medium) and an adsorbent bed of active carbon is used as the adsorbent (col. 4, line 40-43), read on "the heat pump is an adsorption heat pump having a working medium and an adsorbent that is capable of adsorbing and desorbing the working medium" as claimed.

15. Regarding claim 3, Bass's system also includes an air conditioning cooling system (reference 3, 4, 5, & 6 in Figure 1; col. 4, line 1- 10) that cools and condenses ammonia, reads on "the system further comprises a cooling system for cooling and liquefying the working medium that has evaporated during the desorption from the adsorbent" as claimed.

16. Regarding claim 4, the heat pump as taught by Suzuki is able to perform the function of causing the adsorbent (i.e. active carbon) to adsorb the working medium (i.e. ammonia). Critoph teaches the same in details (col. 1, line 12 – 13). And as ammonia passes through the cooling system of Bass, the generation of heat occurs by adsorption and desorption of ammonia (col. 4, line 1 – 10). Therefore, it would be obvious for one having ordinary skill in the art to utilize a heat pump as suggested by Suzuki into Bass' system in order to provide better temperature gradient, resulting in higher electricity conversion efficiency in Bass' system while operating the air conditioning system of Bass.

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17. Regarding claim 5, the system of Bass is for use with a refrigerant (i.e. ammonia) and air conditioner of Bass having a refrigerant circuit for circulating the refrigerant (col. 2, line 20-25), and the air conditioning system of Bass is communicated with the heat pump suggested by Suzuki through a self-powered heater and the coolant to engine cooled by the heat pump. Therefore, it would be obvious for one having ordinary skill in the art to combine the self powered system of Bass with the heat pump of Suzuki in order to provide better temperature gradient, resulting in higher electricity conversion efficiency in Bass' system.

18. Regarding claim 8, the combustion unit 35 of Bass is a truck's fuel tank (col. 2, line 62; claim 1) and the air conditioning system is placed in a sleeper cab of the truck (col. 3, line 40), reads on "the working device is for mounting on a vehicle and the air conditioner is mounted on the vehicle" as claimed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuyu Tai whose telephone number is 571-270-1855.

The examiner can normally be reached on Monday - Friday, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mikhail Kornakov can be reached on 571-272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Xiuyu Tai

2/12/2008

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 4151